

Requested Patent: GB404539A

Title:

A PROCESS FOR PROTECTING VEGETABLE AND ANIMAL GOODS DURING STORAGE ;

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Inventor(s): ;

Applicant(s): REICHsverband des Deutschen GA ;

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Equivalents: ;

ABSTRACT:

Cabbages and other vegetable substances are preserved by storage in air to which a limited and controlled alkalinity is imparted, preferably having a pH value of 7.5 or over. A continuous, controlled ventilation may be employed during the storage which may be effected in store houses, barns, transport means *c.* Subsequent treatment of the substances to remove the alkaline material is not necessary. In an example, cabbage is stored in a chamber in which ammonium carbonate is disposed at a number of places, e.g. in tablet *c.* form in or near the air admission openings. Alternatively, combustible porous bodies of determined size, such as coke from coal, wood, peat or the like, are impregnated with a material yielding a gaseous alkali and are burned to liberate the alkali. The heat liberated by burning a previously dried briquette may be used for drying a freshly impregnated briquette. The briquette may be of such dimensions that it is completely burnt in a predetermined time, say 24 hours. The alkalization may also be effected by liberating ammonia gas from a bottle of liquefied ammonia. Easily volatile amines such as ethyl- or methylamine, or di- or polyalkylamines of similar odour may also be used, and, in liquid state or in aqueous or alcoholic solution, may be introduced into the storage atmosphere by evaporation, spraying *c.* Automatic electrically-operated means may be provided for constantly controlling the alkalinity of the air.

ALSO: Animal and vegetable substances are preserved by storage in air to which a limited and controlled alkalinity is imparted, preferably Ph 7.5 or over. A continuous, controlled ventilation may be employed during the storage which may be effected in storehouses, barns, transport means *c.* Subsequent treatment of the substances to remove the alkaline material is not necessary. In an example, cabbage is stored in a chamber in which ammonium carbonate is disposed at a number of places, e.g. in tablet *c.* form in or near the air admission openings. Alternatively, combustible porous bodies of determined size made, for example, from coal, wood, peat or like coke are impregnated with a material yielding a gaseous alkali and are burned to liberate the alkali. The heat liberated by burning a previously dried briquette may be used for drying a freshly impregnated briquette. The briquette may be of such dimensions that it is completely burnt in a predetermined time, say 24 hours. The alkalization may also be effected by liberating ammonia gas from a bottle of liquified ammonia. In treating, for example, cheese and fish, easily volatile amines such as ethyl- or methylamine, or di- or polyalkylamines of similar odour may be used, and in liquid state or in aqueous or alcoholic solution may be introduced into the storage atmosphere by evaporation, spraying *c.* Automatic electrically operated means may be provided for constantly controlling the alkalinity of the air.

PATENT SPECIFICATION

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Convention Dates
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Corresponding Applications
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COMPLETE SPECIFICATION.

A Process for Protecting Vegetable and Animal Goods during Storage.

- We, REICHESVERBAND DES DEUTSCHEN GARTENBAUES, E.V., a body corporate organised according to the laws of Germany, of 27, Kronprinzenufer, Berlin, N.W. 40, Germany, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—
- 10 This invention relates to a process for protecting vegetable or animal goods from damage during storage, particularly damage caused by bacteria or mould. It has already been proposed in the case of
- 15 grain which is to be stored to produce a change of the P_h -value of the cell fluid by direct contact of the material with alkaline substances. In this manner it is intended to afford protection against the formation of mildew, particularly in cells
- 20 which have been damaged before the storage. This process, however, affords no certain protection, particularly in the case of goods which are to be stored for a
- 25 lengthy period, since it cannot then be prevented that, in consequence of expansion, shrinkage, accidents or the like, which have occurred in or to the goods during the storage, fresh cells become
- 30 damaged. Moreover, owing to variations of atmospheric moisture the water content of the stored goods may increase, which enhances or diminishes the effect of the alkalisation. Finally, a tedious individual treatment is necessary for goods which are easily damaged.
- It has further been proposed to subject foodstuffs, particularly fish, to highly concentrated ammoniacal solution or to pack
- 40 them in gas tight chambers in which ammoniacal gases under pressure are substituted for the atmospheric air. Such methods of storage have been found to be highly disadvantageous, for most food-
- 45 stuffs are rendered inedible by the effect of high ammonia concentrations and those which may sustain such concentrations, must be subjected already after a relatively short time of storage to a special treatment in order to eliminate the ammonia from them. Moreover, these methods are not commercial because they require relatively large quantities of alkaline substance and finally, the necessity for hermetically sealed containers and for a separate after-treatment makes them impracticable on a large scale.
- The present invention relates to a process which is not liable to these disadvantages. It is characterised by a controlled alkalisation of the air surrounding the goods during storage. In this manner the concentration of the atmosphere of the storage chamber remains within such limits of concentration in respect of the alkali that the penetration of the alkaline substance into the goods does not attain that which renders necessary an after-treatment for the separation of the alkali. Experiments which have been made with stored goodstuffs have shown that the P_h value of the surrounding atmosphere is preferably kept at about 7.5 or over. According to the kind of goods to be stored this limit, however may be varied.
- In the process of the invention therefore the atmosphere of the storage chamber is brought into the proper alkaline state and maintained thereat by the introduction of an alkaline material. Hermetic closure of the chamber is not necessary. On the contrary, a continuously controlled aeration of the stored goods may be maintained. Any after-treatment becomes unnecessary. The process of the invention makes it possible to preserve the produce of harvest in any desired chamber in a condition fit for market for a period of months. It can be applied in all provision stores and storehouses, cooling rooms, barns, transport means or the like.
- The following is an Example of the practice of the invention:—
- In a cabbage store of 1000 cubic metres content, in which some 600 double centners of cabbages are stacked, there are distributed 1—2 kilos of ammonium carbonate at about 12 places in the cham-

[Price 1/-]

- ber. After a few hours the air of the chamber acquires the desired P_h value. In order to maintain this condition aright by aerating the chamber, the ammonium carbonate may advantageously be placed in or near the openings for the admission of air or may be compressed into the form of tablets and suspended in the ducts for the entering air.
- 10 The alkalisation of the atmosphere of the storage chamber may also be achieved in other manners. It is particularly advantageous to impregnate combustible porous bodies of determined size, such as
- 15 coke from coal, wood, peat or the like, with a material which yields a gaseous alkali and to burn the porous bodies to liberate the alkali. These bodies may be impregnated by wetting them with a liquid
- 20 adapted to yield a volatile alkali, such as a solution of ammonium chloride, it having been found that the basic nature of the ash of most fuels ensures the liberation of the ammonia from this salt during the combustion. The heat liberated during
- 25 the combustion of a previously impregnated dried briquette may be used for drying a freshly impregnated briquette. The briquette may be made of such dimensions that in the course of a predetermined time, for example, within 24 hours, it is completely burnt. It is then only necessary to attend to the operation once
- 30 a day. This process for alkalising the atmosphere of a storage chamber is particularly cheap and commercial.
- 35 The process of the invention may also be carried out, for example, with the aid of a bottle of liquefied ammonia, the reduction valve of which is so adjusted that a quantity of ammonia corresponding with the size of the chamber and the quantity of goods stored therein issues from the bottle and affects the P_h -value of the air
- 40 within the chamber so that it is on the alkaline side to the desired extent. By means of suitable test papers the P_h -value of the atmosphere can be controlled constantly. If desired, one can, by means
- 45 of telegraphic indication, produced by a potentiometer device, arrange for an automatic control of the alkalisation.
- 50 The invention is not limited to the use of the named alkalising materials. In the case of goods of another kind, for example cheese or fish, there may be used for the alkalisation of the atmosphere organic easily volatile amines, such as ethylamine or methylamine di- and poly-alkylamines of similar odour, which in the liquid state or in alcoholic or aqueous solution can be introduced in suitable manner into the atmosphere, for instance by evaporation or spraying devices.
- 55 Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—
- 60 1. A process for protecting vegetable or animal goods against damage during storage, which comprises the imparting of a controlled and limited alkalinity to the atmospheric air surrounding the goods during storage.
- 70 2. A process according to claim 1, wherein the P_h value of the atmosphere is maintained at about 7.5 or over.
- 75 3. A process according to claim 1 or 2, wherein a gaseous alkaline substance, such as ammonia or an amine, or a solution thereof, or an alkaline liquid or solid substance or mixture of substances is used, which yields a gaseous alkaline substance in the atmosphere.
- 80 4. A process according to claim 1, 2 or 3, wherein the atmosphere of the storage chamber is made alkaline by burning porous bodies which are impregnated with substances adapted to yield ammonia during the combustion.
- 85 5. A process according to claim 4, wherein the combustible body is impregnated by wetting it with a liquid adapted to yield the desired gas and the heat of combustion of a previously impregnated dried body is used for drying a freshly impregnated body.
- 90 6. A process according to claim 4 or 5, wherein the combustible body and its impregnation are so adjusted that the yield of gas occurs during a period of 24 hours.
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Dated this 6th day of June, 1933.

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